

**INTERLABORATORY COMPARISON
Year 2025****Ambient air****Polycyclic Aromatic Hydrocarbons
(PAHs)**

Ineris - 230498 - 2960833 - v1.0

30 January 2025

**Organizer: Ineris - Environmental Characterisation and Impacts on
Human and Biodiversity Department**

Function	First Name/Last Name	E-mail	Phone
Head of "Methods and developments in environmental analysis" Unit	Hugues BIAUDET	hugues.biaudet@ineris.fr	+33 3 44 55 66 19
Scientist Air quality Methods and developments in environmental analysis Unit	Alexandre ALBINET	alexandre.albinet@ineris.fr	+33 3 44 55 64 85
Coordinator	Sylvain BAILLEUL	coordonnateur_air_ambient@cil-ineris.fr	-

Ineris - Parc technologique Alata – PO Box 2- F-60550 Verneuil-en-Halatte

☎ +33 (0)3.44.55.66.77 Internet: www.ineris.fr

TABLE OF CONTENTS

1. BACKGROUND.....	3
2. OBJECTIVES	3
3. AIM OF THE STUDY	4
4. PARTIES INVOLVED	4
5. GENERAL TECHNICAL REQUIREMENTS	4
5.1. Registration procedure.....	4
5.2. Price	5
5.3. Ineris Commitments	5
5.4. Participants' commitments	5
5.5. Communication.....	6
6. ANNEXES	6

1. BACKGROUND

The Directive 2004/107/EC of the European Parliament enforces the monitoring of polycyclic aromatic hydrocarbons (PAHs) in ambient air.

Note: several annexes have been amended by the Directive (UE) 2015/1480.

Article 9 from the French law of October 21st, 2010 regarding air quality monitoring and public information imposes "the participation to interlaboratory comparisons (ILCs) on laboratories performing the chemical analyses for the French air quality monitoring networks".

In this aim, Ineris organizes an ILC to satisfy this requirement.

This document summarizes all the requested details for the registration to this ILC.

The following information included is:

- Participation conditions,
- ILC description.

2. OBJECTIVES

An ILC participation gives the opportunity to the laboratories:

- to compare its results with those of other laboratories carrying out same type of analysis;
- to assess skills of the operators for a given technique;
- to evaluate their analytical (quantification) procedure for a given matrix;
- to meet the requirements of quality references;
- to improve its measurement quality;
- to demonstrate its measurement proficiency in a given environment in order to meet the regulatory requirements to obtain, for an example, an approval or an accreditation.

The achievement of these objectives is evaluated with a performance score (z-score) allowing participants to estimate the accuracy of their results from an assigned value known as reference value, calculated by proven statistical algorithms.

Furthermore, this exercise will help identifying any problems related to the analysis of PAHs in ambient air.

3. AIM OF THE STUDY

The purpose of the study is to implement and carry out an ILC for the analysis of the following species on 3 PM₁₀ ambient air filter samples:

- Benzo[a]anthracene (B[a]A),
- Benzo[g,h,i]perylene (B[g,h,i]P),
- Benzo[a]pyrene (B[a]P),
- Benzo[b]fluoranthene (B[b]F)*,
- Benzo[j]fluoranthene (B[j]F)*,
- Benzo[k]fluoranthene (B[k]F)*,
- Dibenzo[a,h]anthracene (D[a,h]A),
- Indeno[1,2,3-cd]pyrene (In[1,2,3-cd]P).

* *Note:* the sum of the benzofluoranthenes must be also reported.

This ILC exercise may be postponed or cancelled if the number of participants is lower than 12.

4. PARTIES INVOLVED

This ILC is intended for laboratories performing analyses of PAHs in ambient air.

Due to technical limitations, the number of participants is limited to **24**. The priority is given to laboratories performing analyses for regulatory purposes.

5. GENERAL TECHNICAL REQUIREMENTS

5.1. REGISTRATION PROCEDURE

Period for registration is set to:

03 February 2025 to 27 June 2025

on the following website:

<https://comparaisons-interlaboratoires.ineris.fr>

For the **first connection**, i.e without account already existing, the laboratory shall create its account for accessing to website utilities. For that, the laboratory shall have the information below:

- enterprise identification (SIRET, DUNS,...),
- VAT Intra-community number (Europe only).

After validation by Ineris, the laboratory will be able to register to the proposed ILC.

Online help is available on the website.

If the laboratory already has an account, it can access directly to the registration step below.

During the registration phase, the laboratory shall have the information below:

- enterprise identification (SIRET, DUNS,...),
- an order from their internal services addressed to Ineris.

Please note: The BIPEA quote and the form available on the website are not accepted as valid orders. Without a valid order, report will not be provided to the participant. Without a valid order, report will not be provided to the participant.

A confirmation will be sent to the participant 15 days after the end of registration with his lab identification.

5.2. PRICE

Title	Amount in € before tax	20% VAT	Total amount in €, tax included
25-230498-PAH	1850.00	370.00	2220.00

Invoices and payment will be established when sending samples.

Payment by credit card is not accepted.

The general terms and conditions of sale are available in annex 5.

5.3. INERIS COMMITMENTS

Ineris commits to abide by the technical requirements of EN ISO/CEI 17073 standard during the organization of this (these) ILC.

Ineris commits to ensure information confidentiality in the online result submissions and anonymity in the result report by assigning a confidential code to each participant.

Ineris commits to protect participant identity confidentiality by only giving access to the confidential code to a limited number of people within the coordination group.

Ineris commits to notify all participants of any amendment to the ILC schedule and rules as soon as possible.

Confidential information, defined in the general terms and conditions of sale, and where applicable, by the confidentiality agreement, may be communicated to the auditors commissioned by the certifying and accrediting bodies or in the context of an outsourced internal audit, which is themselves subject to a confidentiality agreement. The customer's order constitutes agreement to carry out these communications.

Ineris commits to take into consideration any claim in accordance with the provisions of the Quality Manual (§5.3: 'Stakeholders and listening to customers / Claims') available on the Ineris website at the following address: www.Ineris.fr.

5.4. PARTICIPANTS' COMMITMENTS

Once registered, all participants commit to:

- Fill and return the "Return form" IM-0223 as soon as reception;
- Comply for each parameter of the standard procedures outlined in Annex 1 and Form IM-1541;
- Submit the results in full integrity without falsification nor collusion;

- In case of NON-COMPLIANCE, Ineris reserves the right to disqualify the participant and to take appropriate action.
- Submit all the results on time, except in the case of instrumental troubleshooting which shall be reported prior to the result submission deadline;
- Supply all related metadata upon request.

5.5. COMMUNICATION

Correspondence between Ineris and the participants should be mainly done electronically. Ineris rejects any responsibility in case of undelivered emails. The confidential code must be specified for further correspondence with the coordinator.

All documents related to the ILC can be downloaded at <https://comparaisons-interlaboratoires.ineris.fr>.

6. ANNEXES

Annex number	Title	Pages
1	ILC specifications	1
2	PAHs listed in the Directive 2004/107/EC	1
3	Overall organization of an ILC	3
4	Statistical analysis and results	2
5	General terms of sales	2

Annex 1: ILC specifications

Test	25-230498_Filtre (Filter)
Substances to be analysed	Benzo[a]anthracene, Benzo[a]pyrene, Benzo[g,h,i]perylene, Benzo[b]fluoranthene, Benzo[j]fluoranthene, Benzo[k]fluoranthene, sum of benzofluoranthenes, Dibenzo[a,h]anthracene, Indeno[1,2,3,c-d]pyrene
Date of receipt	Week 37
Deadline for results submission	10 th October 2025
Analytical methods	EN 15549:2008, ISO 12884 :2000, CEN/TS 16645 or equivalent
Test materials	PM ₁₀ ambient air samples (filter punch, Ø ≈ 37 mm)
Number of samples	3 ambient air filters + 1 blank filter
Number of measurements per sample	3
Stability	No
Refrigeration	Yes
Statistical analysis	Assigned value: Robust average by application of the algorithm A from the ISO 13528 standard procedure Standard deviation for assessment: 17% for B[a]P, 25% for the others PAH.
	Performance: z-score except for a population < 8 after exclusion of missing or aberrant results => indicative value
Monitoring of the homogeneity of test materials	No ¹
Monitoring of the stability of test materials	No ¹

¹: see §7 Annex 3

Annex 2: PAHs listed in the Directive 2004/107 / EC of 15 December 2004

Polycyclic Aromatic Hydrocarbons	
SUBSTANCES	Benzo[a]anthracene Benzo[a]pyrene* Benzo[b]fluoranthene Benzo[j]fluoranthene Benzo[k]fluoranthene Dibenzo[a,h]anthracene Indeno[1,2,3-cd]pyrene

* Regulated compound with target value on annual average of 1 ng m⁻³ in the PM₁₀ fraction.

Annex No. 3: General organization of an interlaboratory comparison

The typical ILC schedule is specified below.

- ILC feasibility study (in order to define and assess outline of the optimal test conditions);
- Sampling, sample fortification if required; sample packaging;
- Sending (d = 0) of the test materials to the participants.
- Receipt of the test materials by the participants (d = +1);
- Analysis of the test materials by the participants (d = +1 to + 31; and checking by Ineris of the test material homogeneity and stability all along the ILC, if necessary;
- Result submissions by the participants at <https://comparaisons-interlaboratoires.ineris.fr>;
- Data processing and statistical analysis performed by Ineris;
- Sending of the final report including a satisfaction survey form.

The general organization of the interlaboratory comparison is as follows:

1. ILC feasibility study

Each test material undergoes a feasibility study over several weeks. The homogeneity and the stability have been already evaluated previously on similar test materials (matrices, concentration levels). Test materials will be prepared using similar procedures so that the feasibility study won't be performed again this year.

2. Test announcement

Ineris informs the laboratories of the organization of a test by transmitting the Annual Program and publishing information on the website.

3. Participant registration

Ineris receives the registration request and confirms the registration of the participant by email and provides its laboratory identification.

The instruction form IM1541 is forwarded to participants prior to, or with, the test materials in order to provide instructions (compounds to quantify, storage, handling, etc....) and deadlines. The form is also available at <https://comparaisons-interlaboratoires.ineris.fr>

4. Test material preparation

Test materials are prepared and packaged by Ineris in compliance with official guidelines. Such guidelines deal especially with the nature of the matrices, the concentration levels and the test material preparation in order to assure their quality in terms of stability and homogeneity.

Sending of the test materials is performed by Ineris.

5. Sending of the test materials

The test materials are sent by express delivery post. The delivery quality is monitored by Ineris.

The following document is included in the package:

- Receipt acknowledgements (form IM-0223). Upon receipt of the package, participants are required to send it back to Ineris fully completed;

Test materials are preferentially shipped at the beginning of the week in order to allow the participants to start the analytical process before the end of the week.

All the forms are available at <https://comparaisons-interlaboratoires.ineris.fr>.

6. Receipt and analysis of test materials

Upon opening of the package, participants shall:

- Perform a temperature control check and write the results on the receipt form IM-0223;
- Inspect the package as well as its contents and write any relevant information on the receipt form IM-0223;
- Put the test materials in appropriate storage conditions immediately;

Participants shall start the analysis of the test materials as soon as possible.

7. Checking of the test materials

Given the strong experience and knowledge on such test materials (ambient air filter samples), homogeneity and stability evaluations will be not performed again during this new ILC. The homogeneity of samples collected using the Graseby – Andersen sampler has been tested several times during previous ILCs (Verlhac, 2014, Verlhac and Albinet, 2015).

8. Data Submission

The usual time period for the participants to achieve the analyses and submit their results is of 4 weeks.

The results will be sent by the participant using the <https://comparaisons-interlaboratoires.ineris.fr> site with its personal account.

The technical support is available online in order to help the participants to use the website for result submissions.

Incomplete results may be accepted if a participant, for specific reasons, is not able to analyze one or several compounds.

Results not considered for the statistical analysis are the following:

- values below the limit of quantification “<LoQ”,*
- values entered as zero "0";
- values for which a systematic error (errors of dilution or unit of measurement) is identified (for instance by a factor 1000).

* The methodology will be as follows:

	Data received	Data considered
1st case	C, C, C	C, C, C
2nd case	C, C, <LoQ	C, C
3rd case	C, <LoQ, <LoQ	None
4th case	<LoQ, <LoQ, <LoQ	None

Annex No. 4: Statistical processing and reporting of results

1. Statistical processing

Statistical processing of the results shall be carried out by Ineris in accordance with the requirements of:

- ISO 5725 series: « Accuracy (Trueness and Precision) of measurement methods and results »,
- ISO 13528: « Statistical Methods for Use in Proficiency Testing by Interlaboratory Comparisons ».

The assigned value will be based on the consensus of the results of the entire population participating in the test. It will be calculated using robust statistical methods.

The advantage of the robust analysis is that the calculations of the assigned value (reference value), the confidence intervals and the performance statistics are not affected by the judgment of the data analyst. The results are studied and treated with objectivity.

The standard deviation for the evaluation of the chosen proficiency σ_{pt} is:

- Equal to the third of the measurement uncertainty specified in the European Directive 2004/107/EC i.e. $50\%/3 = 16.7\%$ rounded up to 17% for B[a]P;
- Equal to $75\% / 3 = 25\%$ for the other PAHs.

The performance evaluation will be carried out using the z-score. Each participant will be able to position itself in relation to the assigned value.

2. Restitution of the results

The reporting of the test will be conducted in two steps:

- Sending a preliminary test report, one month after the closing date of entry of the results online. This report will gather the raw results of all participants, the mean, the standard deviation of repeatability, the variation of repeatability coefficient and the performance of each participant for each parameter and each test material. At this stage, **no detailed analysis of the data is performed**. This preliminary report will allow participants to have a first return of the test results.

The preliminary report will be sent to participants only.

- On completion of full statistical processing, and within 3 months after the intermediate report sending, the final report and satisfaction survey will be sent to participants. It will describe the conducting of the test and the results of statistical processing of data submitted by participants. This report will contain:
 - values discarded from data set,
 - raw data,
 - means, standards deviation after statistic treatment,
 - z score with a repartition graph,
 - a distribution curve of the average with standard deviation of repeatability of all participants,
 - General and individual advices.

The final test report is **restricted**. It will be sent to:

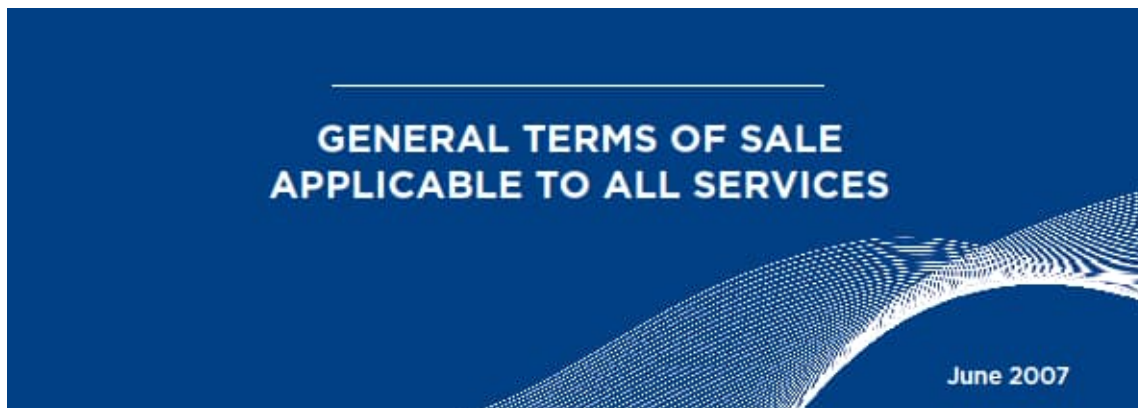
- French reference laboratory for air quality monitoring (LCSQA),
- the participants and / or available at <https://comparaisons-interlaboratoires.ineris.fr> via their personal space.

A satisfaction survey will be sent at the time of sending the final test report.

Please note:

Any decision on formal recognition (accreditation) or legal recognition (approval) of the results is the responsibility of the body issuing the recognition (COFRAC or similar or the French Ministry of the Ecology) only.

Annex No. 5: General terms of sales



I – DEFINITIONS

Order acknowledgement: a written document by which Ineris accepts the customer's order or modifies the terms of the order.

Customer: a corporate entity or person on behalf of whom Ineris agrees to perform a service in exchange for payment.

Contract: the generic term designating any commercial agreement, order, contract or deal, set out on paper and explicitly accepted by Ineris. Ineris refers directly or indirectly to these General Terms of Sale in any contract and by such a contract Ineris commits to providing a service and the customer commits to paying for it as well as covering the cost of any other commitments that they may have.

Proposal: a paper document in which Ineris proposes to perform work (services, provision of supplies, work, etc) and in which a price is set out, whether it is determined or to be determined. All proposals made by Ineris make reference to these General Terms of Sale.

II. GENERAL

Except when formally accepted by Ineris in the specific terms and conditions attached to the proposal, no other conditions may take precedence over those set out in these general and specific terms and conditions.

Ineris only makes a commitment by way of submitting a binding proposal set out on its letterhead. The terms and conditions of the proposal apply only during the stated option period.

On condition that the measures required of the customer as described in the proposal are fulfilled (handover of documents, materials or samples / payment of the deposit / access authorizations...), the contract shall only become applicable and binding after Ineris has acknowledged receipt of the customer's order. In the absence of any receipt acknowledgement within twenty one (21) calendar days following order receipt, the contract becomes binding from the time when the order is received. Any change to the services set out, and that is made after the definitive conclusion of the contract requires a written addenda.

Failure to demand, at any time, any application of one or more proposal stipulations in no way represents a relinquishment by Ineris of its rights and in no way impacts the validity of the measures in question.

Any contract accepted by Ineris cannot simply be cancelled, whether in whole or in part, by the customer. No cancellation can be accepted free of charge. The compensation demanded shall not be less than the costs incurred up to the time of cancellation.

The list of parties involved and listed in the contract is mentioned for information purposes only. Ineris can therefore change the parties that it involves, on condition that they have the necessary expertise in order to fulfill the contract.

Research Tax Credit (under French law): it is up to the customer to ensure that the services performed are eligible for this tax credit before including them in the amounts eligible for their Research Tax Credit.

III – LEAD-TIMES AND DATES (HEREINAFTER REFERRED TO AS LEAD-TIMES)

The lead-times set out in the proposal or in the receipt acknowledgement are provided for information purposes only. Delays cannot in any case justify canceling the order or open up a right to compensation for any loss suffered, whether direct or indirect.

Late delivery penalties may only be demanded if there is an express and written agreement between the parties. They may only be applied if Ineris alone is responsible for the delay and if it causes a true loss duly observed by both parties.

Lead-time aspects are suspended should the customer fail to meet their own obligations.

Ineris is by right cleared of any threat of sanction or penalty should cases of force majeure occur as defined by legal precedent (i.e. events that the parties could not reasonably forecast and control at the time when the contract was entered into, due to their external, unforeseen and irresistible aspect) or due to events outside of Ineris' control and which have been brought to the customer's knowledge as soon as they occur, such as: lock-

outs, strike action, transport bans or delays, legally binding changes to working hours or any other cause that leads to full or partial work stoppages affecting Ineris or its suppliers.

IV – PRICE AND TAXES

All services are billed at the price agreed in the definitive contract. This price may however be corrected as a result of the application of legal stipulations that apply to the scope of the contract.

Prices are stipulated as being exclusive of tax.

For services performed outside of France, all taxes (both direct and indirect), duties, levies and charges of any kind, and especially company taxes of profits, taxes on sales, Customs duties, taxes deducted at source by the Revenue Administration of the country in question, are the customer's responsibility, to be paid directly or by refunding any amounts advanced by Ineris or directly deducted from payments made.

All exchange rate related costs or commissions that may be incurred are to be paid by the customer and cannot be deducted from the price paid to Ineris.

V – BILLING AND PAYMENT

Billing takes place in line with the specific stipulations agreed for the contract.

The payment of amounts owing is to be made to head office, net and without discount, in French currency, thirty days and of month from the invoice date:
/ by check made out to Ineris;
/ by bank transfer.

It is expressly stated that should there be any delay in making payments at the dates that are set, the amounts owing shall by right attract interest on the basis of ten times the legal interest rate set in France, and this without impacting the demand that the debt be settled in full. The cost of any sight drafts returned unpaid or any collection costs incurred are always the customer's liability. Any interest owed for late payments is not subject to French Value Added Tax (T.V.A.). In the event of any late payment, the penalties owed are payable along with the principal.

The amounts owed shall become due immediately, regardless of any conditions agreed previously, should the customer sell, set aside as guarantee or pledge to a company, its business or its equipment.

Payments cannot be differed or changed as a result of penalties owed by Ineris. No compensation can be applied as a result of this.

VI - CONFIDENTIALITY

Ineris staff is duty bound to observe total discretion and, as such, forbid themselves from releasing to any third parties any information regarding the results of the services performed by Ineris at the customer's request and without their permission. The same applies to any information made available by the customer and explicitly identified as being confidential.

These measures do not however apply to:

- / information in the public domain;
- / information that Ineris was already aware of;
- / information obtained legally through sources other than the customer.

VII - INTELLECTUAL AND INDUSTRIAL PROPERTY RIGHTS

Ineris retains full and complete ownership over its diagrams, design work, projects, calculations, processes, handwork, expertise, patents... whether applied or made available, especially when drawing up the proposal and while performing the services. They cannot be released to third parties nor applied without formal approval from Ineris.

Should the services provided lead to a patentable invention, a specific agreement shall be concluded between Ineris and the customer setting out the ownership of the results. As of now, we agree that the sharing of rights shall take into account the financial and intellectual efforts made by each of the parties.

The reports, minutes or other records issued by Ineris shall become the customer's property as soon as Ineris has received payment in full for the services provided. In this case, Ineris cannot release the report, minutes or other record or reproduce it for use by third parties, without the customer's permission.

VIII - SUBCONTRACTING

Ineris is allowed, under its own responsibility, to call on subcontractors.

IX - TERMINATION

The contract shall be terminated by right should the customer fail to meet their commitments and after this is notified to them by Ineris by recorded delivery letter with receipt acknowledgement and if this situation is not corrected within thirty (30) from receipt of this letter. Notwithstanding any damages and compensation owed, the customer will in this case be held liable for all spending incurred up to the time of termination. If the down payment made exceeds the spending incurred, it will be retained by Ineris as compensation.

X - HYGIENE AND SAFETY

Any work performed by Ineris at the customer's facilities must be performed in line with legally binding stipulations, especially those relating to workplace hygiene and safety, and especially those set out in decree 92158 dated 20 February 1992 setting out requirements for work performed at a facility by an outside contractor.

If the customer has consigned to a specific document any general and specific safety rules to be complied with, it is up to them to send them to Ineris, at least ten (10) days ahead of any work by INERIS at the customer's facility.

XI - RESPONSIBILITY

Customer responsibility

Should they wish to visit the Verneuil en Halatte facility, the customer commits to complying with the general stipulations made by INERIS and, where applicable, any specific instructions, especially should the customer have need to intervene at this facility.

The customer assumes full responsibility for any damage caused to Ineris or to its staff due to provision of insufficient or incorrect information.

Ineris' responsibility

Ineris will produce its report:

- / in line with the information provided by the customer. The reports will mention the references of any documents provided. Ineris cannot take responsibility if the customer provides incorrect or incomplete information. In the same way, Ineris cannot be bound to integrate any new data provided by the customer while services are being provided;
- / on the basis of this information, the objective (scientific or technical) data available as well as applicable law.

Only a report that shows up the validation process in line with its quality assurance rules

is likely to bring Ineris to accept responsibility.

When acting as a service provider, Ineris is bound to provide the necessary resources to perform its work. Furthermore, Ineris' role is limited to being bound to provide advice. As such, the opinion, recommendations, suggestions or equivalent made by Ineris as part of the work that it is entrusted with can only comprise enlightening the applicant, but never taking over their decision power.

Given the mission entrusted to Ineris by the act founding it, Ineris never intervenes in actual decision making. Ineris cannot therefore take responsibility in place of the decision maker.

Ineris cannot accept responsibility for any material and immaterial damage linked to the fulfilment of the service to be provided.

Ineris cannot accept responsibility for any technical difficulties encountered while performing the work, due to unforeseen events that cause danger to the safety of persons and property.

Ineris cannot be held responsible for any incorrect interpretations that may be made of its report and/or of any failure to apply recommendations that may have been made in it.

Consequently, the end user shall use the results included in the report in full or at least objectively. Any use in the form of excerpts or summary memos will be performed under the full responsibility of the end user. The same applies to any modification made to it.

Ineris declines all liability for any use of the report outside of the scope of the initial service contract.

In all cases, if Ineris was to be held responsible in the context of the provision of its services, the amounts of any compensation, damages and interest paid cannot in any case exceed the price set in the contract and in any case shall remain within the limit of the coverage provided by the civil liability insurance policy coverage taken out by Ineris.

XII - DISPUTES

Any dispute that may arise is subject to the terms of French law.

In any dispute that relating to its services, the Courts of Senlis (Oise/France) alone shall be considered competent to hear the matter, and this regardless of the terms of purchase and form of payment accepted, even if called in to guarantee another party or if there are multiple defendants.

This present general contractual terms written in English are for information only. The French version shall prevail over any translation that may be made.